

## CLAIMS

1. A chemical mechanical polishing method comprising:  
loading a semiconductor wafer in a wafer carrier;  
rotating the semiconductor wafer in the wafer carrier in a first direction  
5 while a polished surface of the semiconductor wafer is maintained  
against a polishing pad which is rotating in a second direction, the  
second direction being opposite to the first direction; and  
reversing the direction of rotation of one of the wafer carrier and the  
polishing pad during a final polishing operation to remove  
10 embedded particles from the polished surface of the semiconductor  
wafer.

2. The method of claim 1 further comprising:  
while reversing the direction of rotation, spraying the polishing pad with a  
15 liquid to remove the particles from the polishing pad.

3. The method of claim 1 further comprising:  
during a first processing phase, rotating the semiconductor wafer in the  
wafer carrier in a clockwise direction and rotating the polishing pad  
20 in a counter-clockwise direction for a predetermined period of time;  
and  
during a second processing phase, rotating the semiconductor wafer in the  
wafer carrier in a counter-clockwise direction for a final polish  
duration.

4. The method of claim 1 further comprising:  
during a first processing phase, rotating the semiconductor wafer in the  
wafer carrier in a counter-clockwise direction and rotating the  
polishing pad in a clockwise direction for a predetermined period of  
30 time; and

during a second processing phase, rotating the semiconductor wafer in the wafer carrier in a counter-clockwise direction for a final polish duration.

5           5.       A chemical mechanical wafer polishing system comprising:  
a wafer carrier configured to retain a semiconductor wafer during a  
chemical mechanical polishing process;  
a first drive system coupled with the wafer carrier to rotate the wafer carrier  
with the semiconductor wafer in one of a first rotational direction  
10           and a second, opposite, rotational direction;  
a platen configured for mounting a polishing pad, the polishing pad  
polishing a surface of the semiconductor wafer when the wafer  
carrier and the platen are brought into proximity;  
a second drive system coupled with the platen to rotate the platen and the  
15           polishing pad in one of the first rotational direction and the second  
rotational direction; and  
a control system coupled with the first drive system and the second system  
to rotate the semiconductor wafer and the polishing pads in opposite  
20           directions during a first polishing interval and to reverse rotation of  
the semiconductor wafer relative to the polishing pad during a  
second polishing interval to remove embedded particles from the  
surface of the semiconductor wafer.

25           6.       The chemical mechanical wafer polishing system of claim 5 further  
comprising:  
a high pressure liquid spray system adjacent the polishing pad and  
positioned to spray liquid on the polishing pad to remove particles  
from the polishing pad.

30           7.       A chemical mechanical wafer polishing (CMP) system comprising:

wafer rotation means for rotating a semiconductor wafer in one of a first direction and a second direction in the CMP system;

a polishing pad to polish a surface of the semiconductor wafer;

pad rotation means for rotating the polishing pad relative to the rotation of the semiconductor wafer to produce chemical mechanical polishing of the surface of the semiconductor wafer; and

control means for controlling at least one of the wafer rotation means and the pad rotation means, the control means producing a first relative rotation during a first polishing duration and producing an opposite relative rotation during a second polishing duration.

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